



## Exercise Biochemistry Review

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Proceedings of IBEC 2018, Beijing, China, October 23-25  
PO-061

### Differential expression of proteins in urea from male athletes after 30 km running evaluated by proteomics

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**Objective** In order to elucidate the target proteins of exercise-induced stress, differential expression of proteins in urine from male athletes after 30 km running was evaluated by proteomics.

**Methods** Urine samples were collected from ten male runners before and after 30 km running. The differential expression profile of urine proteins was investigated by using a proteomic approach based on two-dimensional gel electrophoresis (2-DE) and mass spectrometry (MS) procedures.

**Results** Totally  $1011 \pm 243$  and  $1737 \pm 15$  protein spots were detected from 2-DE of urine samples harvested from the subjects before and after 30 km running. In addition, 110 protein spots with differential expression were achieved. After exercise, 10 proteins with  $\geq 5$  fold up-regulation and 23 new proteins were observed; 18 protein spots with  $\geq 5$  fold down-regulation were observed and 6 proteins were disappeared. The target proteins were identified as zinc- $\alpha 2$ -glycoprotein, albumin, vitamin D-binding protein, prostate-specific antigen,  $\beta$ -actin and Bence-Jones protein (BJP), which are correlated with the change of energy metabolism pathway, material transport and stress protection in the body.

**Conclusions** An obviously differential protein expression profile in urine samples from the subjects after 30 km running is achieved, which provides a new idea for further exploring exercise-induced proteinuria. However, further studies need to develop urine protein profiles of athletes, which will benefit for monitoring sport competition and doping control as well as excessive exercise-induced diseases.